

## INTRODUCTION

The deterioration of water quality in coastal North Carolina has been documented with a number of physico-chemical and biological methods. One of the most obvious and publicly visible aspects of this degradation is the increasing prevalence of disease in aquatic organisms, especially those associated with dermatological (skin) lesions (i.e., ulcerative mycosis, lernaeosis, etc.). They affect many important fishery populations, such as menhaden, flounder, bass and sea trout (Noga 1986, Noga and Dykstra 1986) and there is increasing evidence that a number of these diseases have reached epidemic proportions in the Albemarle-Pamlico estuary.

While lesions on finfish have been most intensively studied, problems with shellfish have also been recently reported. In June 1987, fishermen in the Pamlico River began to report large numbers of blue crabs (Callinectes sapidus) having lesions on their carapace (McKenna et al 1988). Examination of these lesions by staff of the NCSU College of Veterinary Medicine revealed a diagnosis of shell disease. During the course of the outbreak, up to 90% of crabs in crab pots were affected (S. McKenna, personal communication). Since crabs with significant amounts of shell disease are unsalable, this has caused considerable concern among commercial fishermen (J. Hawkins, personal communication).

Shell disease (also known as rust disease, black spot, or brown spot) is a common syndrome in both freshwater and marine decapod crustaceans (Johnson 1983). It is considered an infectious disease and a number of pathogens have been reported from the lesions. The most commonly isolated pathogens are chitinoclastic bacteria, belonging to the genera Vibrio and Pseudomonas (Johnson 1983). Vibrio and Pseudomonas were among the pathogens isolated from shell disease lesions in A/P Estuary blue crabs (McKenna et al 1988). However, other agents including myxobacteria, psychrophilic luminescent bacteria, and fungi have also been associated with some cases, placing the true cause of this syndrome in question.

Shell disease has been reported in many natural populations of crustaceans (Sindermann 1977), but the prevalence has usually been very low. However, stressful environments increase the risk of disease. Thus, captive or cultured populations (Sindermann 1977) or those in polluted environments, such as sewage dump sites (Young and Pearce 1975), often exhibit a high prevalence. Crustacean populations having shell disease can suffer considerable mortalities. Fisher et al (1976) found a mortality rate of 71% due to shell disease in cultured lobsters compared to only 6% in unaffected animals. Thus, shell disease might reduce the productivity of crustacean populations. Chronic presence of this disease has been a possible factor contributing to the